Bearing Selection Tool

ME423 : Machine Design

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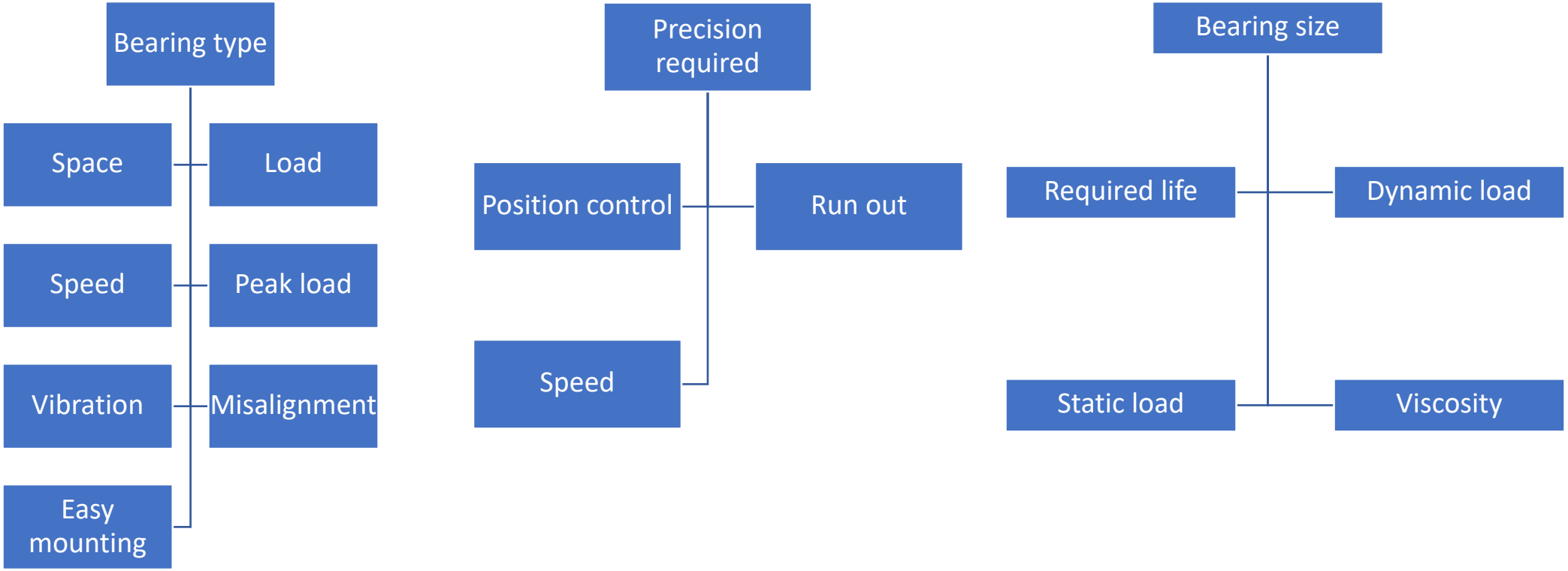
❑ Input data required

Operating conditions and application requirements



❑ Input data required

Operating conditions and application requirements

- Lubrication
  - Lubricant life
  - Relubrication interval
  - Environment
  - Operating temperature
  - Seal type
- Mounting
  - Ease of replacement
    - Procedure for same
    - Tooling
- Fits
  - Ease of mounting and replacement
    - Speed

❑ Basic Selection procedure

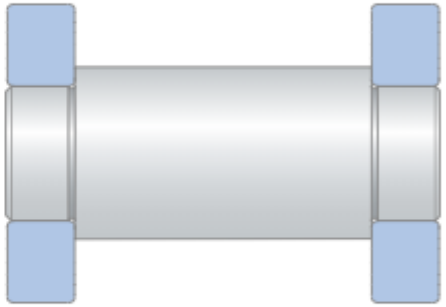
	Performance and operating conditions
	Bearing type and arrangement
	Bearing size
	Lubrication
	Operating temperature and speed
	Bearing interfaces
	Bearing execution
	Sealing, mounting and dismounting

❑ SKF bearing selection tool

Make your selection → Type and arrangement → Select Calculation → Operating load & speed → Operating condition → Summary

Make your selection

Single bearing



Two bearings on a shaft

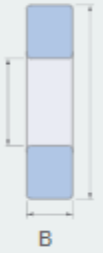
Re-open existing project

❑ SKF bearing selection tool

Make your selection → **Type and arrangement** → Select Calculation → Operating load & speed → Operating conditions → Summary

- Deep groove ball bearings
- Insert bearing (Y-bearing)
- Angular contact ball bearings
- Self-aligning ball bearings
- Cylindrical roller bearings
- Needle roller bearings
- Tapered roller bearings
- Spherical roller bearings

Select bearing type



20-25 d

D min-max

B min-max

Enter exact dimensions or ranges in mm to filter (e.g. 23-27, -40)

Search designation

d	D	B	C	C_0	Designation
mm			kN		
20	42	8	7.28	4.05	▶ **16004**
25	47	8	8.06	4.75	▶ **16005**
25	62	17	22.9	15.6	**305**
25	62	17	22.9	15.6	**305 NR**
25	62	17	22.9	15.6	**305-2Z**
25	62	17	22.9	15.6	**305-2ZNR**
25	62	17	22.9	15.6	**305-Z**

SKF Explorer
▶ Popular item

❑ SKF bearing selection tool

Make your selection → Type and arrangement → **Select Calculations** → Operating load & speeds → Operating conditions → Summary

Select calculation(s)

- No calculations ad
to this list

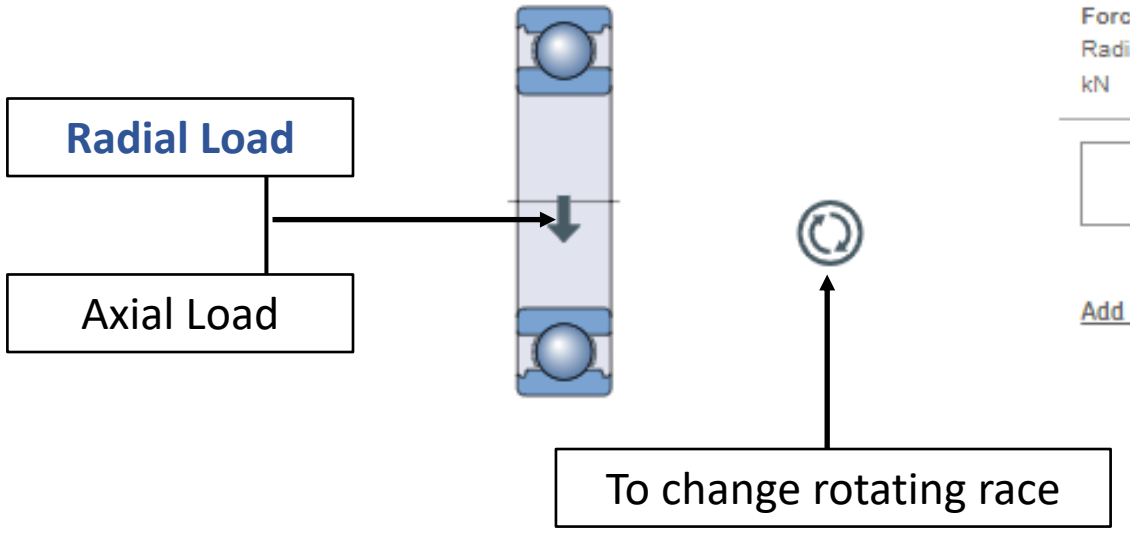
Select calculation(s)

- ☐ Select all
- ☑ Minimum load
- ☑ Viscosity
- ☑ Equivalent dynamic load
- ☐ Bearing frequencies
- ☑ Grease life and relubrication interval
- ☑ Friction and power loss
- ☑ Bearing rating life
- ☐ Adjusted reference speed
- ☑ Static safety factor

Cancel | Next

❑ SKF bearing selection tool

Make your selection → Type and arrangement → Select Calculations → **Operating load & speed** → Operating conditions → Summary



Forces		Speed	Temperature ⓘ	
Radial	Axial		Inner ring	Outer ring
kN		r/min	° C	
0.1	0	400	50	32

Add load case

Calculate

❑ SKF bearing selection tool

Make your selection → Type and arrangement → Select Calculations → Operating load & speed → **Operating conditions** → Summary

Operating conditions

Edit default settings >

Lubrication & contamination
Grease
LGBB2
Extreme cleanliness

Shaft orientation
Horizontal

Radial clearance
Normal

- Normal
- C3
- C4

Lubrication & contamination > Shaft orientation > Radial clearance

Lubrication

Grease or oil	Grease
Lubrication specification method	SKF grease
Lubricant	LGMT 2: all purpose industri...
Proven effective EP additive	☐

Contamination

Contamination model	Simplified guidelines
Cleanliness	Extreme cleanliness

OK

Lubrication & contamination > Shaft orientation > Radial clearance

Shaft orientation

- ◉ Horizontal
- ○ Vertical

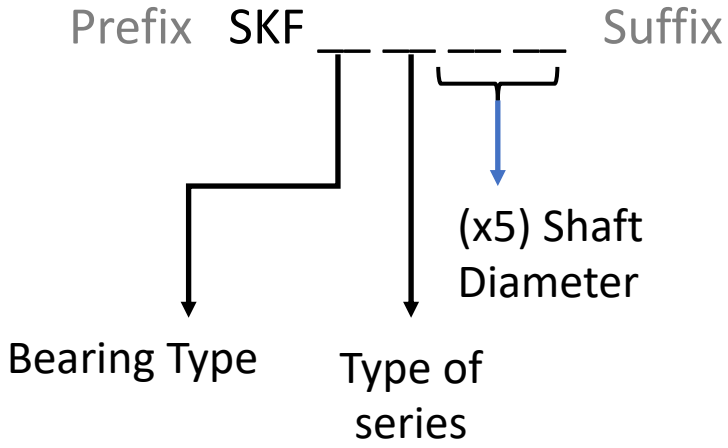
Note: the shaft orientation influences friction and relubrication interval

❑ SKF bearing selection tool

Make your selection → Type and arrangement → Select Calculations → Operating load & speed → Operating conditions → **Summary**

BEARING PROPERTIES	*16004*
MINIMUM LOAD	F_{rm} : 0.01 kN
VISCOSITY	κ : 1.36
BEARING LOADS	C/P: 72.8
GREASE LIFE AND RELUBRICATION INTERVAL	t_f : 30000 h
ADJUSTED REFERENCE SPEED	n_{ar} : 38000 r/min
STATIC SAFETY FACTOR	S_0 : 40.5
BEARING RATING LIFE	L_{10mh} : > 10^5 h
FREQUENCIES	*Please unfold to see results*
FRICTION	M: 2.67 Nmm, P_{loss}: 0 W

❑ SKF and Indian standard bearing designation



IS – 40 – BC - 03

Series type

Bearing Type

Shaft dia. 40mm

Code	Bearing type
0	Double row angular contact ball bearing
1	Self-aligning ball bearing
2	Spherical roller bearing, spherical roller thrust bearing
3	Tapered roller bearing
4	Double row deep groove ball bearing
5	Thrust ball bearing
6	Single row deep groove ball bearing
7	Single row angular contact ball bearing
8	Cylindrical roller thrust bearing
C	CARB toroidal roller bearing
N	Cylindrical roller bearing. Two or more letters are used to identify the number of the rows or the configuration of the flanges, e.g. NJ, NU, NUP, NN, NNU, NNCF
QJ	Four-point contact ball bearing
T	Tapered roller bearing in accordance with ISO 355

Exception:

00 – 10mm

01 – 12mm

02 – 15mm

03 – 17mm

04 – 20mm

05 – 25mm etc.

❑ Theoretical Calculations required

Equivalent load:

$$Pe = S\,[XVFr + YFa]$$

S = Service factor/Shock factor
V = Race rotation factor
X = Radial load factor
Y = Axial load factor
Fr = Radial load
Fa = Axial load

Bearing Life:

$$L_{90} = \left(\frac{C}{P_e}\right)^k$$

C = Dynamic load capacity
K = 3 for ball bearing
K = (10/3) for roller bearing
$\left(\frac{C}{P_e}\right) = Loading\ Ratio$

THANK YOU